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VISIBLE SPRING MIGRATION OF *CICONIIFORMES* AND CRANES, *GRUS GRUS*, ACROSS THE TYRRHENIAN SEA (SOUTHERN ITALY).

RIASSUNTO - *Osservazioni sulla migrazione primaverile dei Ciconiiformi e delle gru sul Mar Tirreno (Italia Meridionale).* Sono state effettuate osservazioni dal 22 marzo al 20 maggio 2002 sull'isola di Ustica (Sicilia) e sono stati osservati 607 uccelli appartenenti a 11 specie. La maggior parte di essi continuava la migrazione senza sostare sull'isola.

Every year, during Spring, an enormous number of birds migrates through Italy coming from the wintering areas in Africa en route to the European breeding ranges; in particular Sicily seems heavily involved in this event even if birds migrate mostly on a broad front. The route across Central Mediterranean appears, in several species, more important in Spring than in Autumn (CRAMP & SIMMONS, 1980; IAPICHINO & MASSA, 1989). Up to now observations on the visible active migration of birds in Italy were concentrated mostly on Raptors (AGOSTINI, 2002). The island of Ustica is an important site for the Spring migration of birds (AGOSTINI & PANUCCIO, 2002; PANUCCIO *et alii*, 2004). This paper gives information about the migration of *Ciconiiformes* and cranes crossing the Tyrrhenian Sea.

Study area and methods

Ustica is a small island (38°42'N-13°12'E) approximately 60 km North of Western Sicily, covering an area of only 7600 ha. There are no important wetlands in the island, but mostly Mediterranean maquis and small cultivated fields and just few open areas.

Observations were made using binoculars and telescope from 9:00 to 18:00 (solar time), for a total of 540 hours. The watchsite was located at the highest point of the Falconiera Promontory, from this site it was possible to detect birds leaving the island from the Northern and Eastern coasts. Birds roosting at the site were also counted just when they were not observed the following morning, to avoid replication of data.

Results and discussion

A total of 607 birds of 11 species were observed (Tab. 1), most of them were Little Egrets, *Egretta garzetta*, (34,3 %); Grey Herons, *Ardea cinerea*, (27,2 %); Cranes (21,8 %) and Night Herons, *Nycticorax nycticorax* (8 %).

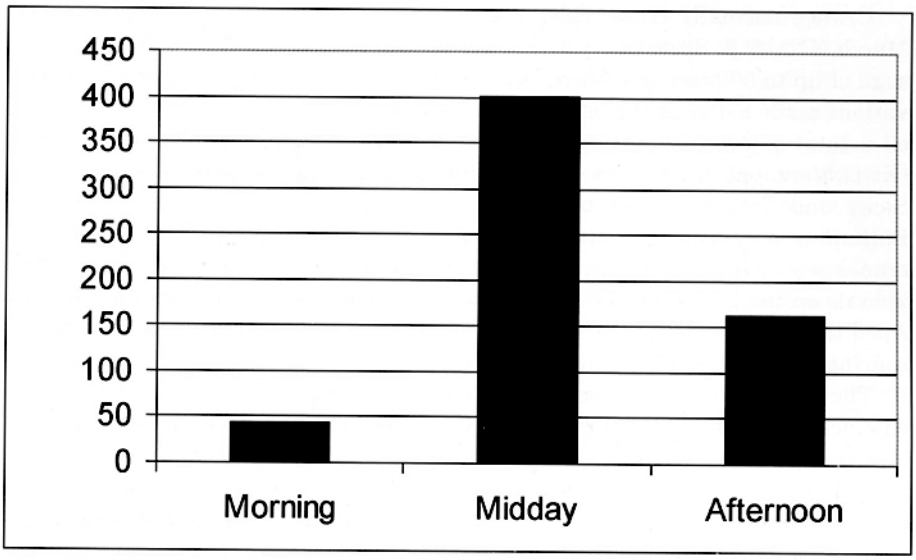

Figure 1 - Variation of migratory flow throughout the day

Table 1 - *Ciconiiformes* and Cranes observed over Ustica between the 22nd of March and the 20th of May 2002.

SPECIES	CROSSING (%)	ROOSTING (%)	TOTALS (n°)
Crane *Grus grus*	100	-	132
White Stork *Ciconia ciconia*	23,5	76,5	17
Black Stork *Ciconia nigra*	100	-	5
Grey Heron *Ardea cinerea*	75,2	24,8	165
Little Egret *Egretta garzetta*	66,8	33,2	208
Night Heron *Nycticorax nycticorax*	77,6	22,4	49
Squacco Heron *Ardeola ralloides*	100	-	13
Little Bittern *Ixobrychus minutus*	-	100	7
Great White Egret *Egretta alba*	100	-	6
Purple Heron *Ardea purpurea*	100	-	3
Bittern *Botaurus stellaris*	100	-	2

Cranes normally cross wide stretches of water and migrate also in early March (CRAMP & SIMMONS, 1980); IAPICHINO & MASSA (1989) reported the passage of up to 500 in early March over Palermo. In Cap Bon Promontory observations made between the beginning of March and the end of April 1990 reported a total of 2000 migrating cranes with peak of 834 birds the 8th of March (KISLING quoted in ISENMANN *et alii,* 2005). The route through Southern Italy, Sicily and Tunisia seems to be used by individuals belonging to Swedish, Finland and Russian populations (CRAMP & SIMMONS, 1980). Over Ustica all cranes were observed in three days and in five flocks of respectively 30 individuals on the 28th of March, 22, 67 and 6 on the 3rd of April and a flock of 7 on April the 14th. All flocks were seen passing over the island without stopping or soaring, they called frequently and used powered flight.

The small number of storks reported in this study (Tab. 1) is not unexpected since, using thermals of rising air (CRAMP & SIMMONS, 1980; LESHEM & YOM-TOV, 1996), these birds tend to migrate over land avoiding long sea crossing. All white storks were surveyed in the first month of observations; they migrated in pairs or small flocks, sometimes stopping migration for several days, remaining in the island feeding in the landscape and roosting on trees. In order to compare the migration of storks it is interesting to report that between the 27th of March and the 31st of May 2004 at the Strait of Messina 109 White Storks and 19 Black Storks were observed; also at that site White Storks were observed mostly in March and April, with a large flock comprising 71 individuals on the 7th of April (PANUCCIO, pers. obs.).

More than 90% of Grey Herons migrated during the first month and mostly in flocks (91,5%) comprising on average 11,62 ± 2,1 birds; the largest flocks observed on 27th of March comprised 42 individuals; moreover 29 were seen together on the 3rd of April, and 32 on April the 21st.

Little Egrets were observed mostly between the 11th of April and the 7th of May (98%) and mostly in flocks (97,6%) comprising on average 13,54 ± 2,6 individuals (max. 41 individuals together on April the 22nd). A total of 69 individuals was observed resting for hours on the rocks in front of the sea at the foot of the promontory.

All Night Herons passed in flocks (average size = 9,8 ± 2,35 individuals) between April (71,43%) and early May. Finally all Squacco Herons, *Ardeola ralloides*, were observed in May and in small flocks (2-5 individuals).

Comparing the variation of migratory flow throughout the day (Fig. 1) it is interesting to report that birds were observed mostly at midday ($\bar{}$= 329.2; d.f.= 2; $P < 0.001$). At Cap Bon Promontory Cranes were observed undertaking the crossing of the Channel of Sicily mostly in the middle of the day (ISENMANN *et alii*, 2005). Our obserbations show that at least some Herons and Storks migrating via Ustica may use the island as a place to break their long flight across the Tyrrhenian Sea for some hours, using the island like a stop over site for feeding. However, among Herons only single birds or small groups (2-3 individuals) were observed feeding on the island as it has been previously report-

ed from other Tyrrhenian islands (FASOLA & ALIERI, 1992). Only in two cases we observed single Grey Herons and one Little Egret, using soaring flight over our watchsite; normally Herons passed down the sea using powered flight. Like Cranes, Herons migrate on a broad front without stopping on an island where they can find few feeding areas (CRAMP & SIMMONS, 1980).

Finally, 133 Herons and Cranes (no Storks) were observed undertaking the water-crossing during the last three hours of observations. Since Cranes fly at an airspeed of 67 km/h over water (ALERSTAM, 1975) and individuals leaving Ustica need more than four hours to reach the coast of Italian peninsula (approx. 260 Km), this behaviour confirm that these birds are able to orientate also after sunset during the sea crossing.

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